The Helm

SPRING | 2016 Illinois-Indiana Sea Grant

Peoria Innovation Team members, from left, project managers Kathryn Shackelford and Kate Green and director Anthony Corso along the Illinois River.

Peoria stormwater issue reaches a tipping point

Forty people gathered in a conference room at the Peoria Riverfront Museum on a snowy January day. Artists, activists, public officials, union representatives, academics, and retirees were there to participate in the first of several planning workshops. They were taking a hard look at the city they call home, and imagining the city they would like it to become.

"The potential is so amazing, its geography, its natural and cultural history," said Anthony Corso, Peoria's chief innovation officer and director of the Innovation Team that helped organize the meeting. "It's a sad state we're in right now, but with the right motivations we can change direction."

Corso was charged with addressing one of the most pressing issues Peoria has: combined sewer overflow. When a wet-weather condition arises and rain and melting snow overwhelm the system, this can result in raw sewage dumping into the Illinois River.

The problem, which for years has plagued the city, is being closely watched by the United States and Illinois Environmental Protection Agencies. The message the agencies gave the city was clear: Develop a plan to fix it.

Kara Salazar, sustainable communities Extension specialist with Illinois-Indiana Sea Grant (IISG), led that visioning session workshop using a complex, web-based planning tool,

In This Issue:

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Tipping Points and Indicators. The tool is a collaboration of 22 scientists and nine institutions. It compiles research from around the Great Lakes that identifies impacts on water quality from multiple land uses—agriculture and urban—in various locations, particularly near lakes and streams.

Tipping Points uses data to help communities and planners understand how close their watershed is to ecological thresholds and what the watershed will look like if land-use decisions continue on the same course. Cross a tipping point, and you risk not being able to rehabilitate an impacted region.

Before this Peoria project, Tipping Points had not been used on such a heavily urbanized location. Purdue PhD student Jingqiu Chen studied the impacts urbanization has on water quality and developed an additional modeling tool specifically based on Peoria's stormwater issues. The tool's ultimate goal is to help communities determine the best way possible—ecologically and economically—to maintain and restore healthy water conditions.

"Peoria has an issue they're trying to resolve and there are very costly solutions to it, but we're helping them explore alternatives that are less costly and would provide other environmental benefits as well," said Dr. Bernie Engle, Purdue department head of Agricultural and Biological Engineering leading the project with Jingqiu Chen.

One way to do that is green infrastructure, which can include parks and open spaces, or installing more porous surfaces. Each of those choices will have positive and negative effects on the community and the goal is to pick the suite that match community values.

The city's goal is to resolve its problem with 100 percent green infrastructure. If the plan is successful, Peoria would be the first in the nation.

Tipping Points is helping Peoria figure out not only what environmental variables need attention, but how to go about choosing among the many green infrastructure options. The program is so targeted, it can, for instance, even help a community like Peoria set aside land for agritourism or rehabilitate wildlife populations.

Peoria will be getting lots of help along the way. University of Illinois Extension and Illinois Water Resources Center will offer guidance to the city to do its part in addressing the state's ongoing nutrient loss reduction strategy as well as provide education opportunities.

"We plan to help residents of all ages learn how to manage stormwater in a different way by showing them what they can do—even in their own homes," said Eliana Brown, IISG stormwater specialist. "They have an opportunity to be part of the stormwater solution that will help protect the Illinois River."

Peoria residents share their community values as part of a workshop session.

Kara Salazar, IISG sustainable communities Extension specialist, introduces Tipping Points to Peoria.

Adrienne Gulley, IISG pollution prevention outreach specialist, models how pollution affects water quality with five Peoria students from 4-H Spark Tank, a U of I Extension program.

Rain barrel use connected to benefits

It's no secret that rain barrels are an environmentally good way to control stormwater runoff and improve water quality. So then why do some people use them while others don't even hook-up the one they have?

Linda Prokopy, natural resources social scientist at Purdue University, along with her staff, asked those questions in her recently completed IISG-funded study. The research, which took place in the Salt Creek Watershed in northwest Indiana, is one of the first to look at the motivations behind urban-suburban residents adoption and subsequent maintenance of rain barrels.

Prokopy studied residents who received a rain barrel through a cost-share program facilitated by Save the Dunes, a local non-profit organization. Data were collected through both surveys and interviews with these residents.

Typical outreach approaches tout rain barrels as environmentally friendly water quality alternatives, but that wasn't necessarily the reason people chose to install one. Those who liked having one and maintained it were people who saw a personal value to the practice.

Prokopy's team found that gardening was an important predictor of rain barrel maintenance. Gardeners reported that they were motivated by saving money on water usage.

"They saw a benefit to themselves, not just to this abstract, nebulous concept of water quality," said Prokopy.

Prokopy's study lends insight into what motivates people to adopt and change behaviors concerning environmental practices.

"If we really want to see long-term changes in environmental conditions, we need people to not only adopt practices, but continue to use them," Prokopy said.

The study, "Understanding Urban-Suburban Adoption and Maintenance of Rain Barrels," is now in press in the journal, *Landscape and Urban Planning*.

Linda Prokopy, Purdue University social scientist, makes use of her rain barrel at her home in Indiana.

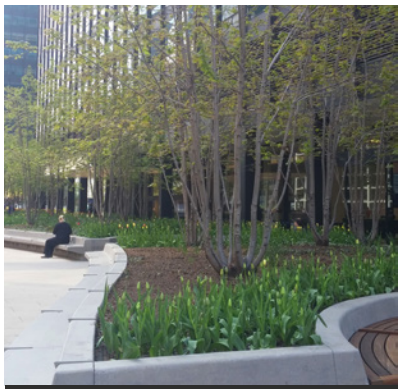
Stormwater troopers go green

Self-professed "stormwater-green infrastructure geeks" recently formed a national networking group around their mutual passion. The founding members hail from three Sea Grant programs: John Bilotta of Minnesota, Becky Tharp of Lake Champlain, and Eliana Brown and Kara Salazar of Illinois-Indiana.

The group, the Sea Grant Stormwater/Green Infrastructure Community of Practice, is providing an opportunity to discuss program models, current issues, and best management practices. Its goal is to form a new stormwater-green infrastructure community of practice for Extension and Sea Grant educators, the Association of Natural Resource Extension Professionals (ANREP), and the National Association of Community Development Extension Professionals (NACDEP).

The emphasis will be on building the network through partnering with current national programs such as the University of Connecticut Nonpoint Education for Municipal Officials Program, the new National Extension stormwater course led by University of Minnesota Extension with funding from the North Central Regional Water Network, and with ANREP and NACDEP.

"We're working all over the country—separately—introducing these practices to communities. It's going to be great to be able to work collaboratively with a shared objective," Eliana Brown, IISG stormwater specialist said. "We are especially interested in learning from each other about the best ways to educate the general public, local decision makers, school children, and professional groups."



Green infrastructure helps reduce stormwater problems in urban environments.

Crude Move Webinar Series

To help people begin to understand the complexities of how crude oil is transported, the Great Lakes Sea Grant Network under the leadership of New York Sea Grant Associate Director Katherine Bunting-Howarth created a four-part webinar series, *Crude Move*.

The goals are to explore the issues, risks, interests, and options for moving crude oil throughout the Great Lakes basin, examine the systems of influence creating current infrastructure, and discuss transportation options with reference to environmental, social, and economic systems.

To date, 178 people attended the first two webinars and 168 viewed the recordings from throughout the country.

"The team felt that this was a good opportunity to broaden Sea Grant's reach, since the crude oil topic is relatively new for the Great Lakes region," said Jill Jentes Banicki, assistant director-programs, communications coordinator at Ohio Sea Grant and host of the webinars. "It's a nice way to get as many people to understand the issue."

Visit ohioseagrant.edu to watch previous recordings or register for the two below:

June 15, 2016
Spill Response Requirements and Regional Capacity

August 17, 2016
Regulatory Activity and Environmental Requirements

GREAT LAKES OIL PIPELINES

Crude oil transport bring

Every day millions of barrels of crude oil are piped, trucked, freighted, and shipped throughout the Great Lakes basin from the Canadian Alberta oil sands and the Bakken oil fields to refineries across the nation. This much crude oil moving around the Great lakes region is not only a challenge for transportation systems but is bringing concerns over the safety of crude oil transport front and center.

Yet crude oil is important to the region, creating economic growth in the form of jobs, industry, agriculture, and government revenue.

Last fall, the Great Lakes Sea Grant Network invited people from academia, industry, and non-profit organizations to Chicago to discuss research that would address concerns inherent to transporting this vital commodity. The goal of the resulting research agenda is to support optimal movement of crude oil throughout the Great Lakes with regards to public safety, the economy, and environmental protection of coastal resources.

"We learned that decision makers have many questions that need to be answered related to the transportation of crude oil," said Margaret Scheneemann, IISG water resource economist and one of the meeting facilitators.

The Chicago workshop followed an initial two-day spring gathering held at Wingspread in Racine, Wisconsin, which brought a diverse set of stakeholders together to get on the same page regarding this complex issue. They reached an agreement on the primary issues surrounding crude oil movement.

"The first workshop really set the stage for subsequent dialogue," said Schneemann. "Given that we're going

s the Great Lakes risks and benefits

to move oil in the basin, can we work together to look at our options and identify what we need to do to better understand those options?"

For example, oil pipelines have become a hot-button issue, especially for some environmental groups and activists.

Ever since the first black gold was commercially drilled in western Pennsylvania in 1859, getting the oil to market has been a challenge. Initially the cost to transport it to the railroad was more than the oil itself was worth. So in 1865 the first reliable pipeline was built and the U.S. hasn't stopped expanding pipelines since.

Today there is more oil than ever before traveling existing routes. Thousands of pipelines snaking through the nation move the bulk of the oil on land. Where pipelines don't exist or aren't sufficient, oil is moved by water, truck, or rail. In the past five years, railroads have seen a 700 percent increase in transporting oil on a system that was never meant to carry that amount.

Regardless of the method of transporting oil, incidents are bound to happen.

Dale Bergeron, Minnesota Sea Grant marine extension educator, is using his background in strategic planning and conflict resolution to encourage stakeholders to slow down and address the situation with a sound science-based, management strategy.

In addition, Schneemann will encourage stakeholders to undertake a monetary accounting of the benefits and risks so that decision makers can make apples-to-apples comparisons.

Statistically speaking, the risk is low that pipelines will fail, but one major spill can be catastrophic as residents near the Kalamazoo River in Michigan saw in 2010 when an Enbridge pipeline ruptured and caused the largest inland oil leak in the United States.

"What is the reality today and what are the impacts of various choices?" Bergeron said. "If we shut down a pipeline, it would not stop the flow of oil. It would just seek another route and perhaps a less safe one. Because refineries need stock, industry needs it, agriculture depends on it, and citizens demand it."

Sea Grant takes AIM in the war on AIS

Not all non-native plants and animals turn out to be invasive in a new environment. How can we predict whether a species poses a threat to local waters? If we could predict that, how can we make the best use of that information?

IISG and University of Notre Dame researchers set out to answer the first question by analyzing which traits help a species thrive in a new environment. They brought this data to an Indiana working group looking to proactively prevent the introduction of invasive plant species through water garden and aquarium retailing. The group of researchers, resource managers, retailers, and hobbyists created a risk assessment tool and their work led to 28 aquatic plants being banned in the state.

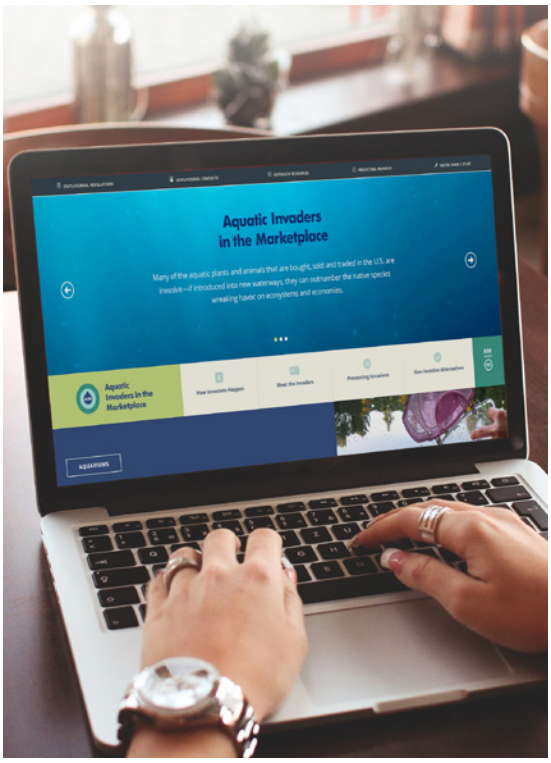
As a result of this work, Notre Dame's David Lodge, and Reuben Keller, now with Loyola University Chicago, were funded through the Great Lakes Restoration Initiative to create risk assessment tools for all taxa in the Great Lakes, including crayfish, fish, mollusks, plants, and turtles. These tools can help decision makers establish consistent and comprehensive regulations focused on species that pose the biggest threat.

Meanwhile, IISG's aquatic invasive species (AIS) team has been pulling out all the stops to distribute information that can help prevent the spread of AIS in trade—in other words, species that are bought and sold for water gardens, aquariums, and to a lesser extent, classrooms. Leading the effort as part of the Great Lakes Sea Grant Network, and informed by social science research from North Carolina State University, the specialists are targeting all levels of this AIS pathway—from retailers to hobbyists—and sharing information across the region through a variety of media.

The suite of tools contains publications for retailers and their customers that include lists of non-invaders as well as known or potential invaders. "Many of these resources are informed directly from the risk assessment findings," said Pat Charlebois, AIS outreach coordinator.

Great Lakes Sea Grant programs and the Sea Grant Law Center are contributing their expertise. For example, Wisconsin Sea Grant created a training video for water garden retailers, and Ohio Sea Grant hosted a webinar for aquarium hobbyists. In addition to writing news articles, other programs helped craft non-technical versions of relevant state regulations to give retailers easy access to the information.

All of this work is raising awareness and potentially changing behavior. "Most of the retailers that have received materials about the risk of AIS have reported that they will distribute publications and talk with their customers about invasive species, and a majority will avoid selling them," said Greg Hitzroth, IISG AIS outreach specialist.



You can find these resources and many more on the new website *Aquatic Invaders in the Marketplace* (AIM) or TakeAIM.org. AIM are aquatic plants and animals available for sale that can negatively impact ecosystems, economies, or public health. These organisms are commonly found in the live food, aquarium, pet, biological supply, live bait, water garden, and aquaculture industries.

This comprehensive resource provides a wealth of information for resource managers, retailers, hobbyists, aquatic farmers, and more on how to prevent the spread of AIS that can happen with plants and animals that come to new environments through the marketplace. The website includes links to regulations, lists of contacts and invasive species, and species prediction tools for the Great Lakes and beyond.

Staff Updates

Laura Kammin
Outreach Program Leader

Laura Kammin connects with program specialists to oversee the development, delivery, and expansion of science-based programs that help communities make informed choices in managing natural resources. She helps to enhance program partnerships. Kammin joined IISG in 2010 as the pollution prevention outreach specialist. In that role, she expanded the unwanted medicine disposal program to 57 communities. Kammin has a Master's degree in wildlife ecology from the University of Illinois.

Sarah Zack
Pollution Prevention Extension Specialist

Sarah Zack develops outreach activities for pollution prevention projects, especially related to management of pharmaceuticals and personal care products in the environment, microplastics pollution in the Great Lakes, and other emerging contaminants of concern. For five years, Zack was on IISG's aquatic invasive species team and was instrumental in the Be A Hero-Transport Zero™ campaign. Zack has a Master's degree in biology with an emphasis on aquatic ecology from Loyola University Chicago.

Ben Wegleitner
Social Science Outreach Assistant

Ben Wegleitner is working with communities at contaminated sediment sites as part of the Great Lakes Legacy Act. He is helping to create outreach materials, host educational events, and maintain a social media presence to connect communities with large-scale remediation projects on their waterways. Before coming to IISG, he was with Southwest Badger Resource Conservation & Development. He has a Master's degree from Central Michigan University.

Lydia Utley
Data Analyst

Lydia Utley is a data analyst working on the GIS portion of the *Tipping Points and Indicators* decision tool. Utley received her Master's degree in environmental management from Duke University, Nicholas School of the Environment, and was most recently a GIS analyst and database manager for the Florida Fish and Wildlife Conservation Commission.

Danielle Hilbrich
Aquatic Invasive Species (AIS) Outreach Educator

Danielle Hilbrich guides the AIS team's social science efforts, and will lead IISG's participation in the Great Lakes Sea Grant Network pet-take-back events. Before taking on this expanded role, Hilbrich was the program's AIS outreach assistant. Since joining IISG in 2011 she had earned her Master's degree in natural resources from the University of Illinois.

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Students connect with real-time buoy data

A brand new curriculum focused on incorporating real-time buoy data created "for teachers by teachers" is now available.

In the summer of 2014, 14 Illinois and Indiana science, math, and geography middle and high school teachers attended a day-long training workshop in Michigan City, Indiana. The teachers learned how to incorporate buoy data into their classroom instruction, and developed data-rich, STEM-based lesson plans that boost understanding of Great Lakes issues by incorporating real-time data from Great Lakes buoys.

Lake Michigan by the Numbers engages students in problem-based scenarios such as using infographics to represent data, information, and knowledge; examining rates of heating in water vs. land vs. air; and linking water quality data to fish species.

"This innovative, teacher-developed collection provides educators with numerous examples to improve their weather, science, and geography units," Terri Hallesy, Extension education coordinator said. "We hope it inspires students to serve as stewards of their local aquatic resources."

To find this curriculum, go to bit.ly/1TZHZ01.